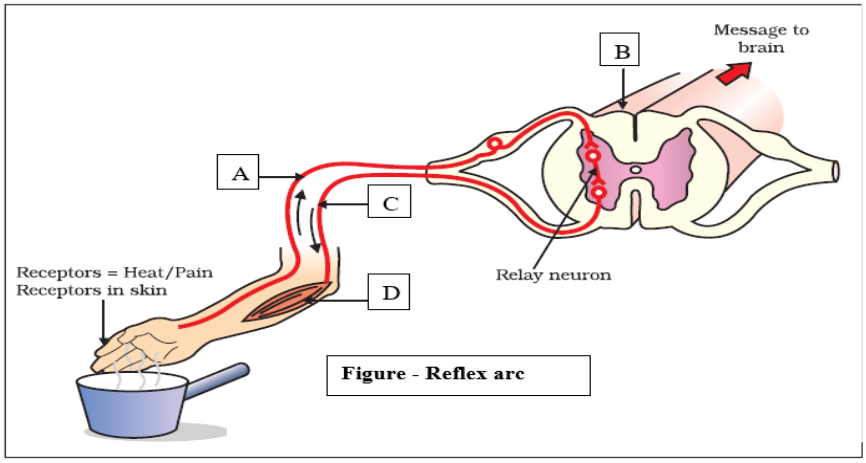
Indian School Al Wadi Al Kabir
Mid-term Examination (2025-2026)

Class: X | Subject: Science (086) | Max. marks: 80
Date: 21/09/2025 | Set- II | Time: 3 Hours

General Instructions:
(i) This question paper consists of 39 questions in 3 sections. Section A is Biology, Section B is Chemistry, and Section C is Physics.
(ii) All questions are compulsory. However, an internal choice is provided in some questions. A student is expected to attempt only one of these questions.

	Section – A	**MARKS**
1	In which of the following groups of organisms is food material broken down outside the body and absorbed? A. Mushroom, green plants, *Amoeba* B. Yeast, mushroom, bread mould C. Paramecium, Amoeba, Cuscuta D. Cuscuta, lice, tapeworm	1
2	Which is the correct sequence of air passage during inhalation? A. Nostrils → larynx → pharynx → trachea → lungs B. Nasal passage → trachea → pharynx → larynx → alveoli C. larynx → nostrils → pharynx → lungs D. Nostrils → pharynx → larynx → trachea → alveoli	1
3	What prevents backflow of blood inside the heart during contraction? A. Valves in the heart B. Thick muscular walls of ventricles C. Thin walls of atria D. All of the above	1
4	The filtration units of the kidneys are called A. ureter B. urethra C. neurons D. nephrons	1
5	Which of the following statements is correct about receptors? A. Gustatory receptors detect taste while olfactory receptors detect smell. B. Both gustatory and olfactory receptors detect smell. C. Auditory receptors detect smell, and olfactory receptors detect taste. D. Olfactory receptors detect taste, and gustatory receptors smell.	1

6	In a synapse, a chemical signal is transmitted from A. dendritic end of one neuron to axonal end of another neuron. B. axon to the cell body of the same neuron. C. cell body to the axonal end of the same neuron. D. axonal end of one neuron to dendritic end of another neuron	1
7	Posture and balance of the body are controlled by A. cerebrum B. cerebellum C. medulla D. pons	1
The following two questions consist of two statements – **Assertion** (A) and **Reason** (R). Answer these questions by selecting the appropriate option given below: **A. Both A and R are true, and R is the correct explanation of A.** **B. Both A and R are true, and R is not the correct explanation of A.** **C. A is true, but R is false.** **D. A is false, but R is true.**		
8	**Assertion (A):** The opening and closing of the pore is a function of the guard cells. **Reason (R):** The guard cells swell when water flows into them, causing the stomatal pore to close. Similarly, the pore opens if the guard cells shrink.	1
9	**Assertion (A):** We need to have iodised salt in our diet. **Reason (R):** Iodine is necessary for the thyroid gland to make thyroxin hormone.	1
10	Label the parts (a), (b), (c) and (d) in the figure given below –  **Figure - Reflex arc**	2
11	**<u>Students are to attempt either option A or B.</u>** A. Name the following. (i) The process in plants that links light energy with chemical energy. (ii) Organisms that can prepare their own food. (iii) The cell organelle where photosynthesis occurs. (iv) Cells that surround a stomatal pore.	2

	OR B. Differentiate between an artery and a vein.	
12	Answer the following: (i) Name the endocrine gland associated with the brain? (ii) Which gland secretes digestive enzymes as well as hormones? (iii) Name the endocrine gland associated with the kidneys? (iv) Which endocrine gland is present in males but not in females?	2
13	Why is blood circulation in the human heart called double circulation? Why is it necessary to separate oxygenated and deoxygenated blood in mammals and birds?	3
14	What are plant hormones? How do auxins promote the growth of a tendril around a support?	3
15	What do some animals, for instance, squirrels, experience when they are in a scary situation? Their bodies have to prepare for either fighting or running away. Both are very complicated activities that will use a great deal of energy in controlled ways. Many different tissue types will be used, and their activities will be integrated into these actions. However, the two alternate activities, fighting or running, are also quite different! So here is a situation in which some common preparations can be usefully made in the body. These preparations should ideally make it easier to do either activity in the near future. How would this be achieved? If the body design in the squirrel relied only on electrical impulses via nerve cells, the range of tissues instructed to prepare for the coming activity would be limited. On the other hand, if a chemical signal were to be sent as well, it would reach all cells of the body and provide the wide-ranging changes needed. This is done in many animals, including human beings, using a hormone called adrenaline that is secreted from the adrenal glands. **<u>Attempt either subpart A or B.</u>** A. How does our body respond when adrenaline is secreted into the blood? **OR** B. Why is adrenaline secretion more effective than just nerve impulses in preparing an animal's body for a scary situation? C. What are the two possible responses of animals like squirrels in a scary situation? D. Where is the location of the adrenal glands in the human body?	4
16	**<u>Attempt either option A or B.</u>** A. (i) Draw the diagram of the alimentary canal of man and label the following parts. Mouth, Oesophagus, Stomach, Small Intestine (ii)Why is the small intestine in herbivores longer than in carnivores?	5

	OR B. (i) Draw the diagram of the excretory system of man and label the following parts. Urethra, kidneys, ureters, urinary bladder (ii) How is the amount of urine produced regulated?	
	Section – B	
17	The electrolytic decomposition of water gives H_2 and O_2 in the ratio of: A. 1: 2 by volume B. 2: 1 by volume C. 8: 1 by mass D. 1: 2 by mass	1
18	Which of the following is an example of an endothermic process? A. Formation of slaked lime. B. Decomposition of vegetable matter into compost. C. Dissolution of ammonium chloride in water. D. Digestion of food in our body.	1
19	When hydrogen chloride gas is prepared on a humid day, the gas is usually passed through the guard tube containing calcium chloride. The role of calcium chloride taken in the guard tube is to A. Absorb the evolved gas B. Moisten the gas C. Absorb moisture from the gas D. Absorb Cl^- ions from the evolved gas	1
20	Copper utensils slowly lose their shiny brown surface and gain a green coat on prolonged exposure to atmospheric air. This is due to the formation of a coating of A. Copper sulphate B. Copper carbonate C. Cupric oxide D. Cuprous oxide	1
21	Which one of the following statements is true about the position of metals in the activity series of metals? A. Copper is below hydrogen but above lead. B. Iron is below lead and zinc. C. Zinc is below magnesium but above aluminium. D. Magnesium is below calcium but above aluminium.	1
22	Which among the following is not correctly matched? A. Salt of a strong acid and a strong base - Na_2SO_4 B. Salt of a strong acid and a weak base - NH_4Cl C. Salt of a strong base and a weak acid - Na_2CO_3 D. Salt of a strong acid and a strong base - CH_3COONa	1

23	Identify the non-metal which is lustrous from the following. A. Carbon B. Iodine C. Gallium D. Bromine	1
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24	**Assertion (A):** Carbon is a metal that can exist in different forms. **Reason (R):** Graphite is an allotrope of carbon and is a conductor of electricity.	1
25	A compound 'X' is used in the manufacture of cement. When dissolved in water, it evolves a large amount of heat and forms compound 'Y'. A. Identify 'X' and 'Y'. B. Write the chemical equation for the reaction of 'X' with water.	2
26	**Attempt either option A or B.** A. You might have noted that when copper powder is heated in a china dish, the reddish-brown surface of the copper powder becomes coated with a black substance. (i) What is this black substance? (ii) Write the chemical equation of the reaction that takes place. (iii) How can the black coating on the surface be turned reddish brown? **OR** B. 2 g of ferrous sulphate crystals are heated in a dry boiling tube. (i) List any two observations. (ii) Name the type of chemical reaction taking place. (iii)Write a balanced chemical equation for the reaction and name the products formed.	3
27	(i) How do metal carbonates and metal hydrogen carbonates react with acids? (ii) Taking magnesium as a metal, write balanced chemical equations in both the cases mentioned above. (iii) State the method to test the gas evolved in the reactions.	3
28	A girl met with an accident and her leg was fractured. She went to an orthopaedic surgeon for treatment. On examination, the doctor mixed a white powder in water and applied it to her leg along with the cotton and gauze. After a while, it turned into a white, solid, hard mass. The doctor said that it would support her fractured bone and help it to heal in the right position.	4

	A. What is the 'white powder' and 'white hard solid mass' called? Write the chemical formula of 'white powder' and 'white hard solid mass'. B. After treatment, the doctor repacked the white powder back into a moisture-proof, airtight container. Why? **OR** Write a chemical equation to show the reaction between white powder and water. C. At what temperature does the white powder form? (a) 100 ^{0}C (b) 273 K (c) 300 K (d) 50 ^{0}C	
29	**Attempt either option A or B.** A. A chemical compound 'X' is used in the soap and glass industry. It can be prepared by heating a compound 'Y'. (a) Write the chemical formula of 'X' and 'Y'. (b) Write the equation involved in its preparation from 'Y'. (c) List other possible applications of 'X'. (d) Why is electrolysis of brine called 'Chlor-alkali process'? (e) Write the chemical equation involved in Chlor-alkali process. **OR** B. Equal length of magnesium ribbon is taken in two test tubes, A and B. H_2SO_4 is added to test tube A, and H_2CO_3 is added to test tube B in equal amounts. (a) Identify the test tube showing a vigorous reaction. Give a reason to support your answer. (b) Name the gas liberated in both the test tubes. How will you prove its liberation? (c) Write the balanced chemical equation for both reactions. (d) Out of the two acids taken above, which one will have a lower pH value and lower H^+ ion concentration, respectively? (e) List any two cases where metals do not follow their typical physical characteristics.	5
	Section – C	
30	A student uses a concave mirror to focus sunlight and light a piece of paper. Where should the paper be placed for maximum heating effect? A. At the pole of the mirror B. At the focus of the mirror C. At twice the focal length D. At the centre of curvature	1
31	If a beam of red light and a beam of violet light are incident at the same angle on the inclined surface of a prism from the air medium and produce angles of refraction r and v, respectively, which of the	1

	following is correct? A. r = v B. r > v C. r = 1/v D. r < v	
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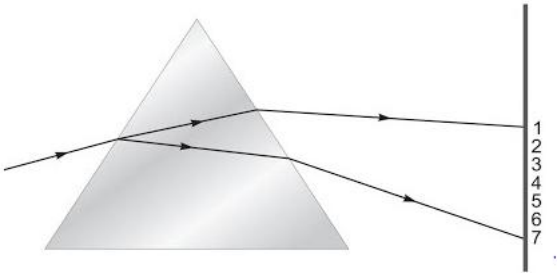
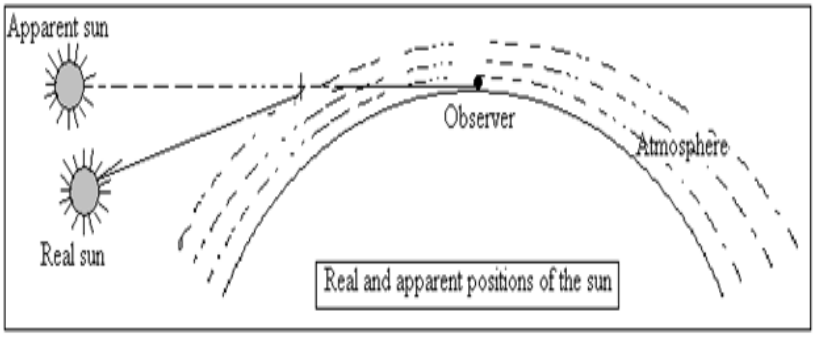
32	**Assertion (A):** A concave mirror can form both real and virtual images. **Reason (R):** When an object is placed beyond the focus of a concave mirror, the image formed is real and inverted.	1
33	Define the term power of accommodation of the human eye. What happens to the image distance in the eyes when the distance of an object is increased gradually from about 5 m to 500 m from our eyes?	2
34	**<u>Attempt either option A or B.</u>** A. A beam of white light falling on a glass prism gets split up into seven colours marked 1 to 7 as shown in the diagram.  A student makes the following statements about the spectrum observed on the screen. (i) The colours at positions marked 3 and 5 are similar to the colour of the sky and the colour of gold metal, respectively. Is the above statement made by the student correct or incorrect? Justify. (ii) Which two positions correspond closely to the colour of (a) a brinjal? (b) 'danger' or stop signal lights? **OR** B. A light ray passes through three media, A, B, and C, with refractive indices 1.0, 1.3, and 1.5, respectively. (i) Arrange these media in order of increasing optical density. (ii) In which medium will light travel slowest? Calculate the speed of light in that medium.	2

35	A person is unable to see distinctly the objects placed beyond 2 m from his eyes. Name the defect of vision the person is suffering from. List two possible causes of this defect and write the type of lenses used for the correction of this defect. With the help of a ray diagram, show the correction of this defect.	3
36	(i) Name the type of mirror used in the following: a) Solar furnace b) Rear-view mirror in a vehicle (ii) A real image, $1/5^{th}$ the size of the object, is formed at a distance of 18 cm from a mirror. What is the nature of the mirror? Calculate its focal length.	3
37	(i) A lens produces a magnification of -0.5. Is this a converging or diverging lens? (ii) Rakhi was playing with a thin beam of light from a laser torch by directing it from different directions on a convex lens held vertically. She was surprised to see that in a particular direction, the beam of light continues to move along the same direction after passing through the lens. State the reason for her observation. Draw a ray diagram to support your answer.	3
38	Atmospheric refraction is the change in the direction of propagation of electromagnetic radiation traversing the atmosphere. This refraction is caused by the light passing through the air. The velocity of light passing through air decreases with an increase in its density. Refraction can raise or lower and shorten or broaden the images of distant objects. The atmosphere is made up of gas and dust particles with different optical densities. When a light ray passes through these particles of various densities, it causes a change in its speed, which then changes the direction of the travelling light.  A. Why does light change its direction when it passes through the atmosphere? B. List two practical phenomena or daily observations which can be explained based on atmospheric refraction. **<u>Attempt either subpart C or D.</u>** C. Explain with the help of a labelled diagram that the position of a star as seen by us is not its true position.	4

	OR D. Explain the reason why stars appear to twinkle and the planets do not twinkle.	
39	**<u>Attempt either option A or B.</u>** A. (i) State the laws of refraction of light. (ii) In an experiment with a rectangular glass slab, a student observed that a ray of light incident at an angle of 55^0 with the normal on one face of the slab, after refraction, strikes the opposite face of the slab before emerging into the air, making an angle of 40^0 with the normal. Draw a labelled diagram to show the path of this ray. What value would you assign to the angle of refraction and angle of emergence? (iii) A light ray hits a plane mirror at 30° to the normal. What is the angle between the incident ray and the reflected ray? **OR** B. (i) Draw a ray diagram to show the formation of the image by a convex lens when an object is placed in front of the lens between its optical centre and principal focus. (ii) In the above ray diagram, mark the object-distance(u) and image-distance(v) with their proper signs (as per the Cartesian sign convention) and state how these distances are related to the focal length(f) of the convex lens in this case. (iii) Find the power of a convex lens which forms a real and inverted image of magnification -1 of an object placed at a distance of 20cm from its optical centre.	5